



## **WARNING Disconnect Power Before Working on or Near Any Electrical Components.**

To achieve the desirable effect of a "cushioned" start of motorized equipment, Acco offers the reliable, effective Acceleration Control Module IV (ACM IV). The Acco ACM IV is a solid state electronic device designed to provide reduced starting torque and controlled acceleration of three-phase motors. When used in conjunction with monorail and crane drive motors, the ACM IV offers a soft controlled start that reduces the swinging action of suspended loads caused by uncontrolled abrupt starts.

The Acco ACM IV is an effective replacement for ballast resistor and fluid couplings used in the past, and offers a number of advantages over these units, including: full drive speed; solid state reliability; a wide range of adjustability; reduced physical size; and increased serviceability.

### **Construction**

The Acco ACM IV consists of a low voltage printed circuit control board mounted on a power switching panel. Starting torque and acceleration rate are varied by adjusting dials to accommodate differing requirements.

### **Operation**

*Single Speed Operation:* Soft, controlled starting and gradual acceleration is achieved by furnishing an increasing percentage of the line voltage to the drive motor via the Acco ACM IV. When power is applied to the motor control circuitry, a timing signal is generated within the Acco ACM IV. This timing signal is routed to a set of silicon controlled rectifiers which then switch the motor current on and off in step with the timing signal. This switching action provides pulses of line voltage to the motor, beginning with a series of short pulses and gradually increasing to constant full voltage. The rate of increase in pulse duration is varied by manually adjusting the unit to suit the existing requirements of starting torque and acceleration time.

*Two-Speed Operation:* The operation of the Acco ACM IV is basically the same as in single speed applications. The function of the unit is to provide controlled starting in low speed and to prevent a sudden surge when going from low to high speed. An auxiliary timer prevents undue loading of the drive motor by allowing it to come to

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**ACCO®**

**ACCELERATION  
CONTROL MODULE  
ACM IV**

full speed in low before switching to high speed. The Acco ACM IV also helps to avoid a sudden drop in speed when switching from high to low speed, further reducing load swing.

### **Adjustment**

Mounted directly in the main electrical enclosure and wired in series with the motor leads, the Acco ACM IV is easily accessible for adjustment.

*Single-Speed Operation:* The ACM IV provides three adjustment dials; acceleration, low speed torque, and high speed torque. For single speed motors only acceleration and low speed torque adjustments are used. The low speed torque should be turned clockwise so that the crane or monorail carrier begins to move the instant the signal is given. The acceleration is then adjusted so that the rate of increase in motor torque is reasonably quick, but still slow enough to inhibit excessive load swing.

*Two-Speed Operation:* Low speed starting torque and acceleration time are adjusted in the same manner as for a single speed unit. The high speed torque adjustment is then set so that the movement of the load is no greater in coming to full high speed than it was in achieving full low speed.

Proper adjustment of the Acco ACM IV will result in easier handling of delicate, fragile loads and better control of large loads.

### **Maintenance**

The Acco ACM IV is a complete solid state unit and requires no complicated adjustments or periodic maintenance. If a problem should arise, it is an easy operation to remove the problem unit for repairs and replace it with another unit thus keeping downtime to a minimum. Due to the minimum size and cost of the ACM IV it is often advisable to stock a spare unit.

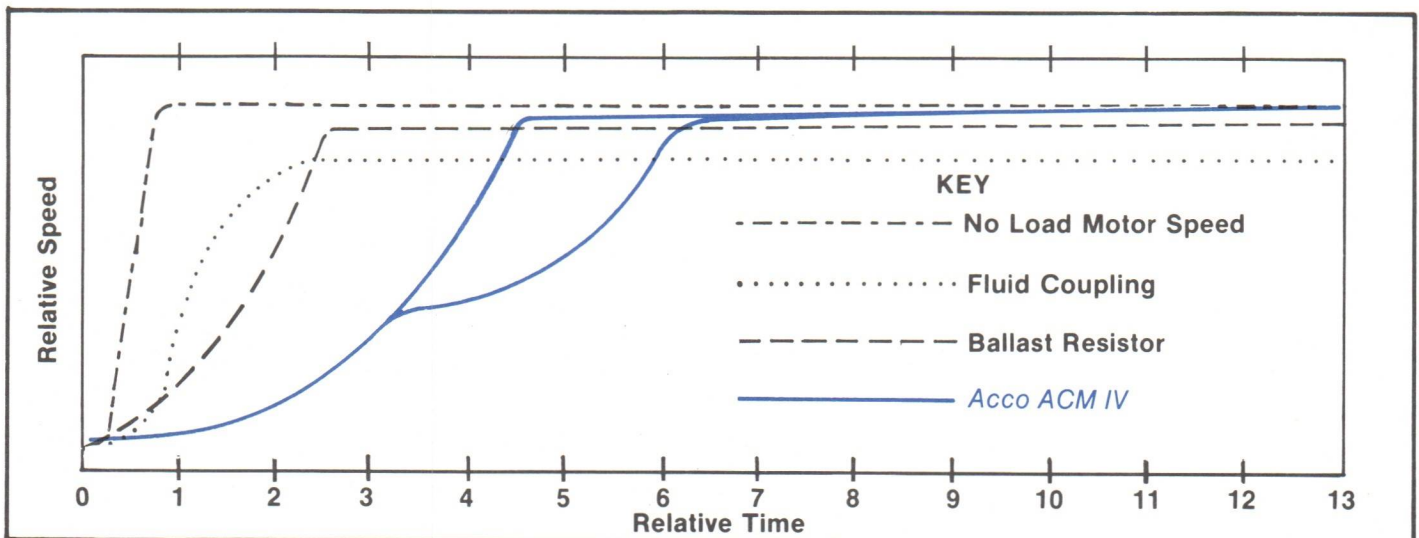
### **Voltages**

Available for 230/460 or 575 volt A.C. operation, the 230/460 volt is a dual voltage unit. To change from 230 volt to 460 volt (or vice versa) requires only the interchange of two wires on the input/output voltage terminal strip. The 575 volt unit is not reconnectable.



### Efficiency

Comparative tests under identical operating conditions indicate the Acco ACM IV solid state control system provides softer acceleration than fluid couplings and ballast resistors and offers greater overall efficiency. The graph below illustrates relative acceleration rates and output RPM of a motor with no load; with a fluid coupling; with ballast resistors; and with Acco ACM IV. Note the gradual acceleration rate provided by the Acco ACM IV and that full rated motor speed is achieved. The graph represents the acceleration rate control of a single speed motor or the low speed of a two speed motor. When the second speed is called for, the ACM IV recycles and repeats the cushioning effect on the acceleration rate of the motor.



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